ANTIBIOTICS SHOULD NOT BE ROUTINELY PRESCRIBED AFTER INCISION AND DRAINAGE OF UNCOMPLICATED ABSCESSES

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Approximately 3 million bacterial skin infections are managed in US emergency departments (EDs) each year, with approximately 1 in 4 requiring incision and drainage.[1] The avoidance of systemic antibiotic therapy after adequate incision and drainage of uncomplicated abscesses has been a fundamental principle of emergency medicine antimicrobial stewardship since it was included in the American College of Emergency Physicians' inaugural set of Choosing Wisely recommendations in 2013.[2] This recommendation, based on several randomized controlled trials that failed to demonstrate a significant reduction in treatment failure with antibiotics after incision and drainage,[3] has recently been challenged according to results from 2 recent randomized controlled trials. Both Talan et al[4] and Daum et al[5] observed significantly higher clinical cure rates and reductions in new abscesses with antibiotics compared with placebo. These congruent results represent the majority of data used in 2 recently published meta-analyses that also conclude that there is a benefit favoring antibiotics in the management of uncomplicated abscesses.[6,7] However, although these results seem to provide more directional clarity, they have paradoxically given rise to a unique clinical dilemma that carries significant public health implications.

Uncomplicated abscesses represent the only bacterial infection for which antibiotic therapy may reduce overall treatment failure, yet does not benefit the majority of patients. Considering all available trial data, approximately 70% to 90% of adult patients do not require an antibiotic after incision and drainage to resolve their infection.[3,5] Reflecting the narrow margin of benefit, results from Daum et al[5] indicate that 7 patients need to receive trimethoprim-sulfamethoxazole after incision and drainage to prevent one treatment failure. However, this study used a composite definition of treatment failure that included the development of skin infections. When this component of the composite outcome is removed, there is no longer a significant difference in cure rates between trimethoprim-sulfamethoxazole (85.2%) versus placebo (81.3%), and the number needed to treat for any short-term benefit increases to 26. Although Talan et al[4] did not use a composite outcome, their results also produced a similar overall number needed to treat for trimethoprim-sulfamethoxazole (14). Regardless of what number needed to treat is used, it is clear that routine prescribing of antibiotics after incision and drainage of uncomplicated abscesses would conservatively result in tens of thousands of patients' receiving antibiotics unnecessarily each year in the United States alone. The fact that not a single subject in either of the recent trials (n=2,051) developed sepsis or died because of complications of their skin infection indicates this is a relatively benign condition and provides further rationale for a selective approach to antibiotic prescribing.[4,5]

Translating the recent trial data into best practice guidelines will require a candid discussion about statistical versus clinical significance that aims to answer the following question: Should there be an effect size and associated number-needed-to-treat threshold that is required before antibiotic therapy is considered standard of care? This process must also take into account that antibiotics are unique among all pharmacologic therapies. Prescribing antibiotics diminishes their effectiveness over time and increases hospital and community bacterial resistance pressures.

Beyond resistance, a widely accepted global public health crisis, antibiotics also carry substantial risks to individual patients.[8] For example, antibiotics are responsible for nearly 20% of all ED visits for adverse drug events, which include rare life-threatening conditions such as anaphylaxis and Stevens-Johnson's syndrome.[9] In a comparative analysis, the antibiotics most commonly used for abscesses, trimethoprim-sulfamethoxazole and clindamycin, were associated with the highest rates of moderate to severe allergic reactions.[9] Overall adverse event rates observed in the 2 recent randomized controlled trials were surprisingly minor: similar between placebo and trimethoprim-sulfamethoxazole but with an increased risk of diarrhea in the clindamycin group. There were 2 treatment-associated severe adverse events connected to trimethoprim-sulfamethoxazole.[4,5] The overall number needed to harm with antibiotics reported in a recent meta-analysis of abscess randomized controlled trials was 23.[6] Although none of the subjects in either of the recent randomized controlled trials developed a *Clostridium difficile* infection, these studies were not powered to compare adverse event rates. Antibiotics are the primary risk factor for *C difficile,* which causes an estimated 29,000 deaths annually in the United States.[10]

Moving forward, we propose that antibiotic prescribing for uncomplicated abscesses be considered only for high-risk patients, including those with immunocompromised status, history of methicillin-resistant *Staphylococcus aureus* (MRSA) or MRSA as abscess cause, systemic symptoms, or limited access to follow-up care.[11] Although immediate identification of MRSA as the cause of the abscess at treatment is not possible with traditional culture methods, results from a randomized controlled trial indicate that molecular MRSA diagnostic assays can rapidly and reliably detect MRSA after incision and drainage in the ED.[12] Additionally, before deciding to prescribe antibiotics, providers should engage patients in meaningful shared decisionmaking that involves open discussion of their potential to benefit from antibiotics (number needed to treat), individual patient safety concerns (number needed to harm), and public health considerations. This approach should adequately address clinician concerns over treatment failure while helping to preserve the crucial public health resource known as antibiotics.

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